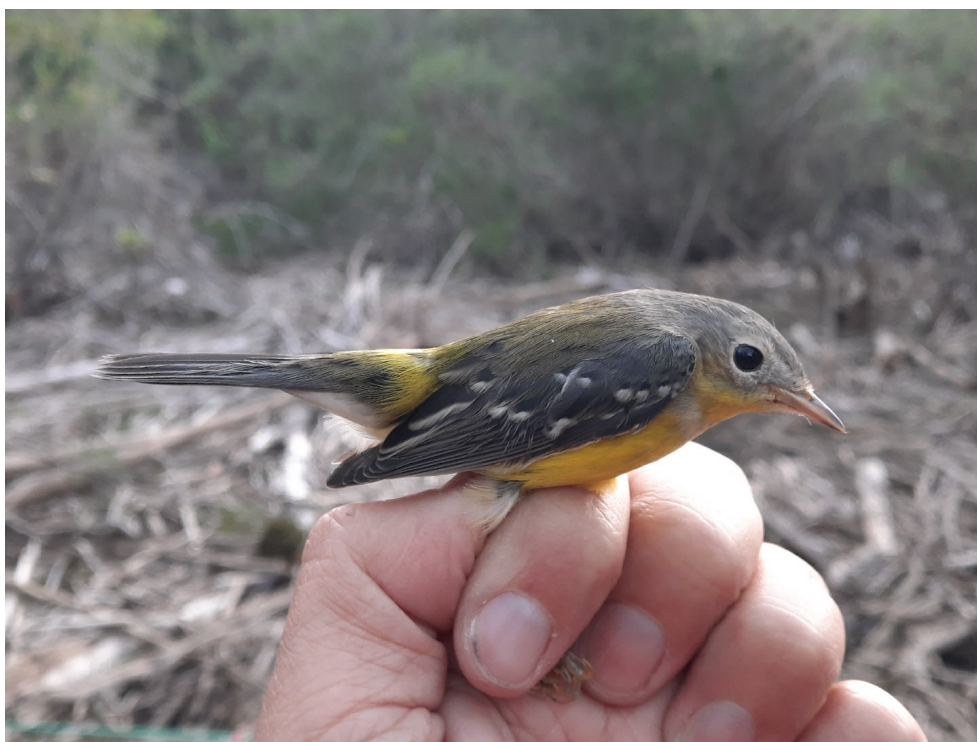


Teslin Lake Bird Observatory Annual Report 2022



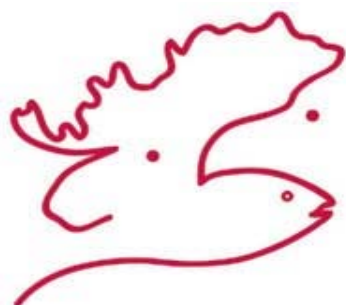
Ben Schonewille
Society of Yukon Bird
Observatories February 2023

The 2022 operation of the Teslin Lake Bird Observatory was made possible due to support and financial contributions from the following organizations.



**Environment
Canada**

**Environnement
Canada**



**Yukon Fish and Wildlife
Enhancement Trust**



**Yukon 
Bird Club**

Cover Photo: A Magnola Warbler banded at TLBO during the fall 2021 season (Photo: Jukka Jantunen).

The Teslin Lake Bird Observatory is operated by the **Society of Yukon Bird Observatories** (SOYBO; PO Box 30056, Whitehorse, YT, Y1A 5M2). SOYBO was established in 2010 to serve as an umbrella society to coordinate bird monitoring activities and associated educational programs at the Yukon Bird Observatories field stations. The objectives of SOYBO are: (1) contribute to the conservation of migratory birds in western North America, (2) to help people learn about the natural history and conservation of Yukon avifauna, and, (3) to work with other societies, organizations and individuals with similar objectives. For further information, visit the SOYBO website at www.yukonbirdobservatories.org

SUMMARY

During 2015, the Yukon Bird Observatories (Teslin Lake and Albert Creek) were granted full membership status to the Canadian Migration Monitoring Network (CMMN). The Yukon Bird Observatories are the northernmost and the only stations located within the core of Canada's Boreal Forest.

The Teslin Lake Bird Observatory completed its fifteenth consecutive year of fall migration monitoring in 2022. The field station operated for a total of 78 days between July 29 and October 18. The observatory has followed the same operating procedures since standardized migration monitoring began during the fall of 2008.

Crews followed standard methods to mist net, handle, band and record information from captured birds. They banded a total of 1,156 birds of 41 species with 4,330 net hours (26.7 birds/100 net hours). Alder Flycatcher, Myrtle Warbler, Yellow Warbler, Boreal Chickadee, and Ruby-crowned Kinglet were the five most common species banded, accounting for over 58% of all individuals banded. The observatory surpassed a significant milestone on August 27 when Jukka Jantunen banded the site's 50,000th bird, a hatch year Alder Flycatcher.

Visual migration and lake counts were conducted to collect monitoring data for bird species not adequately sampled by mist netting (for example diurnal raptors, loons and grebes). Between August 20 and October 18, personnel spent 124.5 hours doing visual counts and observed 15,926 individuals (128 birds per hour) which is well below average compared to previous years.

Noteworthy results from 2022 included:

- The number of birds banded and the capture rate was the lowest to date since the project began during 2008.
- Alder Flycatcher is typically the most frequently banded species at TLBO and this was once again the case during 2022 with a total of 286 individuals banded.
- One new species – Pomarine Jaeger – was observed for the first time at the observatory during 2022.
- A total of 439 raptors and 7,384 waterfowl were observed on the visual migration counts.
- The lake counts tallied a total of 63 bird days of shorebirds (6 species), 498 bird-days of loons (4 species), 297 bird days of grebes (2 species) and 700 bird-days of gulls/terns/jaegers (7 species).

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1.0 Introduction

This report describes methods and results of work done at the Teslin Lake Bird Observatory from July 30 to October 18, 2022, the fifteenth year of fall operation at this site. No new activities were undertaken at the observatory in 2022.

Previous annual reports and the database of band recoveries can be found on the Society of Yukon Bird Observatories website: www.yukonbirdobservatories.org

1.1 Background

The observatory collects information on birds which is shared through an international bird banding database (Canadian Wildlife Service Bird Banding Office and USGS Bird Banding Laboratory), Society of Yukon Bird Observatories annual station reports, and other publications. During 2015, the Yukon Bird Observatories (Teslin Lake and Albert Creek) were granted full membership status to the Canadian Migration Monitoring Network (CMMN). The CMMN is a nationwide network of 26 member stations from across Canada that collect standardized bird monitoring data and collaborate on research projects. The Yukon Bird Observatories are the northernmost stations and are located within the core of Canada's western Boreal Forest.

Many of the birds banded and observed at Teslin Lake are highly migratory, spending the winter months as far south as Central and South America. In addition to the knowledge gained from band recoveries, the observatory also continues to gather baseline data of birds (and their migration) in the Teslin region and the Yukon as a whole. Due to the large landmass of the territory, and the relatively few bird biologists and advanced birders in the Yukon, there is still a great deal to be learned regarding the bird life of the Yukon. The observatory serves as a highly valuable research and monitoring project to better understand the distribution of the Yukon's bird species, some of which are considered uncommon or rare. Over the long term, the data collected at the observatory will facilitate trend analysis for a number of species. Such information will be valuable for conservation and monitoring of bird populations not only in the Yukon, but North America as a whole. In addition to monitoring bird populations, the observatory collects a substantial amount of data on each bird banded. Information such as age, sex, measurements (wing, tail, etc.) and molt timing continue to add to the knowledge base of such information across North America.

The observatory plays a role in education as a place where the public, volunteers and students can take part in a unique, community-based research and monitoring project. Numerous people visit the observatory on an annual basis and the field station has become a valuable training opportunity for individuals interested in learning about ornithological research and monitoring methods.

1.2 Goals of the Teslin Lake Bird Observatory

The goals of the Teslin Lake Bird Observatory are to:

- Gather baseline information on birds and bird migration in the Teslin area.
- Collect data to facilitate the long-term monitoring (*i.e.* trend analysis) of birds in the southern Yukon.
- Conduct and participate in specific studies such as feather collecting for stable isotope analysis and color banding.
- Provide a setting for the public including school groups to learn about birds and bird migration.
- Provide employment and training opportunities for students and volunteers.
- Provide a unique tourist attraction for the community of Teslin.

1.3 Objectives of the 2022 Season

The objectives of the 2022 field season at the Teslin Lake Bird Observatory were to:

- Continue the fall monitoring work using previously established protocols,
- Collect an additional year of bird monitoring data to be used for future trend analysis,
- Further refine the techniques to capture and band owls,
- Collect information on the molt timing of adult passerines banded, and,
- Compare 2022 bird migration results to the previous 12 years of similarly collected data.

1.5 Acknowledgements

The 2022 operation of the Teslin Lake Bird Observatory would not have been possible without financial assistance from the following organizations/groups: Environment and Climate Change Canada (Canadian Wildlife Service), Yukon Fish & Wildlife Enhancement Trust Fund, Teslin Renewable Resources Council, and EDI Environmental Dynamics Inc. Yukon Parks provided use of a space in the Teslin Lake campground for an extended period of time to allow our long-term volunteers a place to camp for the duration of the 2022 season. Jukka Jantunen's excellent bird identification skills ensured high quality data collection, particularly during the visual migration counts which are challenging to complete with a high level of accuracy and consistency. Jukka has been the Bander in Charge at TLBO since full scale fall operation of the observatory began during 2008. Ted Murphy-Kelly assisted with field operations and observatory logistics including scheduling of volunteers. The following individuals also helped staff the station as assistant banders: Ted Murphy-Kelly, Julie Bauer and Avery Bartels. Sean Munro assisted with the data summaries included within this report/

We appreciate the help from the following volunteers without whom the operation of the observatory would not have been possible:

- more than 10 days – Alissa Kazi
- 5 to 10 days – Pam Sinclair
- Less than 5 days – Cameron Eckert, Shyloh van Delft, Jared Clarke, Kristina Beckmann, Todd Mahon, Cathy Koot, Maleen Mund, Lena Ware, Joachim Bertrand, Sean Munro and Adam Perrier.

2.0 Methods

2.1 Study Site

Teslin Lake is a 125 km long by 2-5 km wide lake in the south-central Yukon near the border with British Columbia. The standard count area is located near the outlet of 10 Mile Creek at the site known locally as Ten-mile Point; this area is located on the east shore within the north third of the lake. The lake falls in a natural trench that runs to the northwest and serves as a migration route for many bird species coming from breeding areas to the north in Yukon and Alaska. The site falls within the Yukon Southern Lakes Ecoregion (Boreal Cordillera Ecozone)¹.

During the 2005 season, the observatory was located on the shoreline of Nisutlin Bay; however, issues associated with land tenure of the site led to a new site being used since 2006. The current site is located on 10 Mile point approximately 10 km northwest of the community of Teslin. The observatory is located in the riparian zone between Teslin Lake and the Yukon Government Campground (Figure 1). The vegetation within the site is a mixture featuring a transition from bare gravel lakeshore to shrubs and larger deciduous trees. Also within the site is a small wetland area connected to Teslin Lake which has seasonally fluctuating water levels. The area is dominated by willow (*Salix* spp.) and alder (*Alnus* spp.) with some mature white spruce (*Picea glauca*), trembling aspen (*Populus tremuloides*) and balsam poplar (*P. balsamifera*) scattered throughout.

2.2 General Methods

The methods for the operation of the bird observatory follow the Teslin Lake Bird Observatory Field Protocol and Manual². A summary of the field protocol is described in the following sections; however, for a detailed description refer to the publications page of the Society of Yukon Bird Observatories website (www.yukonbirdobservatories.org).

All monitoring activities at the observatory can be separated into standardized and non-standardized methods. To facilitate long-term analysis of the observatory's data, the standardized data is collected in the same format year after year. Non-standardized activities may include species-specific mist nets within the count area or the collection of banding/observation data outside of the standard count period.

¹ Smith, C.A.S., Meikle, J.C., and Roots, C.F. (editors), 2004. Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes. Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01, Summerland, British Columbia, 313 p.

² Schonewille, B. 2011. Teslin Lake Bird Observatory (TLBO) Field Protocol (version 2). Society of Yukon Bird Observatories.



Figure 1. Overview of the Teslin Lake Bird Observatory (60.2319 °N, -132.9159 °W). The numbers and red lines are mist nets, each 12 m long with the exception of net 28 which is 18 m in length. There is a campground bordering the mist netting area on the south side (right hand side of the photo). The red line with the “C” is the non-standard canopy net which was not used during 2021.

For every species observed, estimated totals are calculated for each day of operation using the following categories:

- Band: new birds banded.
- Recaptures: previously banded birds, not included if recaptured on the original day of banding.
- Visual Migrants
 - Migration Watch: birds observed in obvious migration flight, only includes individuals observed during the visual migration counts.
 - Incidental: birds observed in obvious migration flight, only includes individuals observed incidentally (i.e., not during the visual migration counts).
- Observed: birds observed, but not in obvious migration flight; includes incidental observations and the lake counts.

Using the categories outlined above, the Bander-In-Charge estimates the total number of individuals observed within/passing through the count area within the standard count period on a daily basis. Using only the standard count period data, this number represents the Daily Estimated Total (DET) and when the non-standard data is included, this number represents the Daily Species Total (DST). The DET data will provide the basis for future trend analysis of the data collected at the observatory.

During 2022, the operation of the Teslin Lake Bird Observatory was led by the Primary Bander in Charge Jukka Jantunen. Jukka was responsible for overseeing all activities at the observatory including the capture/banding of birds, supervising volunteers, conducting the visual migration watches, recording the daily estimated total data and entering the data. Ted Murphy-Kelly was Co-Station Manager which included station logistics, staffing and filling in for the primary bander. Ben Schonewille was also a Co-Station Manager and looked after data analysis and the preparation of this report. Board members of the Society of Yukon Bird Observatories helped administer the Yukon Bird Observatories.

Site infrastructure is minimal at this site. A narrow trail connects the banding table to the nets and to the station access point via the Yukon Government campground. There is no covered blind from which to watch birds and nets are removed at the end of the season and are stored away from the site. The site is partially below the high-water mark of Teslin Lake and on land owned by the Yukon Government as a component of the campground reserve. To date this level of activity has not required any permitting aside from the federal and territorial permits required for the capture and banding of birds, and a permit from Yukon Parks allowing extended use of a campground site.

2.3 Mist Netting

The primary method of monitoring the movement of birds through the study site is the use of mist nets for the purpose of capturing and banding birds. The observatory operates with 22 standard mist nets and one non-standard mist net (Figure 1). No non-standard nets were used in 2021; note that in previous years a trial canopy net (net ID = C on Figure 1) was used. All nets are 30 mm mesh, 4 panels tall, and 12 m in length, with the exception of net 28 which is 18 m in length. The standard mist netting effort begins at official sunrise and continues for 6 hours. The full mist netting effort is achieved only on days when adequate personnel are present onsite and weather conditions are favourable. If full effort is not possible, then the number of nets operated is reduced rather than reducing the duration of effort.

2.4 Visual Migration Watch

Visual migration counts are conducted on all days of operation to supplement the banding data. All watches are conducted from the observation site (Figure 1) and involve scanning the sky with binoculars and a spotting scope to observe and count all birds flying past the site. The protocol states that as a minimum, 10 minutes of watch shall be conducted per hour (6 hours) followed by a 1 hour watch at the end of the mist netting period. On many days of operation the visual count effort is substantially more. The visual migration counts aim to monitor diurnal migrating species such as raptors and large waterfowl. Most nocturnal migrants such as most warblers, sparrows and thrush are well-monitored by mist netting. However, for some species which are not adequately covered by mist netting, the visual counts allow for monitoring data to be collected for these species.

Whenever possible, additional information on age, sex and/or color morph is collected for the birds observed during the visual migration watches. Particularly for raptors, the information can supplement the data collected by providing information on the proportion of younger birds.

2.5 Lake Counts

Completed in conjunction with the visual migration counts, a thorough lake count is performed daily from the observation site with a spotting scope to enumerate all birds on or over Teslin Lake which are visible from the predetermined viewing location. These counts target a wide range of species including; loons, grebes, some waterfowl, gulls and some species of shorebirds.

2.6 Incidental Observations

Incidental observations are collected on a continuous basis at the observatory. For example, birds observed on the ground or in the vegetation while conducting mist net checks would be considered incidental observations. Birds in obvious directed migration but not during standard visual migration watches, e.g. flying overhead in flocks or raptors passing overhead, were recorded as ‘incidental migrants’.

2.7 Molt Scoring

As supplementary information, in order to assess the timing of molt, we rate the growth of new flight feathers in adult birds that are banded. Although information on the prebasic molt (amount of juvenile plumage remaining) is collected for hatch year birds, a particular emphasis was placed upon collecting wing molt scores for molting adult individuals because this tells us about the timing of the molt as it relates to the timing of migration in various species of adult birds.

Wing molt score is achieved by assigning each individual wing flight feather a score from zero (old feather remaining) to five (new feather fully grown) and adding them together. Birds that have not yet started to molt have a cumulative score of zero whereas individuals which have completed molt would have a score of 75 (based on 9 primary flight feathers) or 80 (10 primary flight feathers).

2.8 Public Engagement

To attract members of the public to the observatory, we put up posters at various common buildings in Teslin including the Nisutlin Trading Post, Yukon Motel, Teslin Tlingit Council Administration Office and Post Office. We also advertised the observation through digital media including the Yukon Bird Observatories blog, Facebook page and website. Interested individuals could also find articles in the the Yukon Government Wildlife viewing program calendars and media advertising.

3.0 Results & Discussion

3.1 Station Operation

The 2022 fall season included a total of 78 field days between July 29 and October 18. Standardized mist netting occurred on 54 days between July 29 and September 30 and non-standard mist netting occurred on a single day only (August 29).

A total of 1,156 birds of 41 species were banded and 127 species were observed (Table 1, Table 2). The all-time total number of birds banded at Teslin Lake Bird Observatory is now 50,837 birds of 96 species and 210 species have been observed (Appendix A). No new species were banded during 2022; however, one new species (Pomarine Jaeger) was observed at the site on October 13. The observatory surpassed a significant milestone on August 27 when Jukka Jantunen banded the site's 50,000th bird, a hatch year Alder Flycatcher.

Table 1. Summary statistics for the 2022 fall season.

Week	Date	Days Operated ¹	Birds Banded				Visual Counts		Total Species Observed
			#	Species	Net Hours	#/100 Net Hours	# of Visual Migrants ²	Counting Hours	
1	29 Jul – 4 Aug	4	38	12	118.0	32.2	14	0.0	39
2	5 – 11 Aug	7	79	18	343.0	23.0	81	0.0	51
3	12 – 18 Aug	6	140	18	390.0	35.9	133	0.0	52
4	19 – 25 Aug	7	197	22	643.0	30.6	255	2.0	63
5	26 Aug – 1 Sep	7	190	24	555.5	34.2	2,218	5.2	71
6	2 – 8 Sep	7	194	21	536.0	36.2	4,732	20.4	73
7	9 – 15 Sep	7	130	15	658.0	19.8	1,057	17.5	55
8	16 – 22 Sep	7	83	13	502.5	16.5	1,269	11.3	52
9	23 – 29 Sep	7	97	9	479.0	20.3	1,010	13.5	55
10	30 Sep – 6 Oct	7	8	3	105.0	7.6	445	13.1	62
11	7 – 13 Oct	7	-	-	-	-	1,393	20.8	44
12	14 – 20 Oct	5	-	-	-	-	3,319	20.7	40
ALL	29 Jul – 18 Oct	78	1,156	41	4,330	26.7	15,926	124.5	127

¹ Requires a minimum of 3 hours onsite with full estimated totals recorded (does not require mist netting if weather conditions are adverse).

² Note this total includes visual migrants counted during the visual counts and incidental visual migrants observed.

Table 2. Birds banded during the 2022 fall season (not including special projects).

Common Name	Scientific Name	# Banded	# Banded / 1000 Net Hrs
Sharp-shinned Hawk	<i>Accipiter striatus</i>	9	2.08
Spotted Sandpiper	<i>Actitis macularius</i>	1	0.23
Belted Kingfisher	<i>Ceryle alcyon</i>	5	1.15
Western Wood-Pewee	<i>Contopus sordidulus</i>	1	0.23
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	2	0.46
Alder Flycatcher	<i>Empidonax alnorum</i>	286	66.05
Least Flycatcher	<i>Empidonax minimus</i>	2	0.46
Hammond's Flycatcher	<i>Empidonax hammondii</i>	9	2.08
Warbling Vireo	<i>Vireo gilvus</i>	9	2.08
Common Raven	<i>Corvus corax</i>	1	0.23
Black-capped Chickadee	<i>Parus atricapillus</i>	4	0.92
Golden-crowned Kinglet	<i>Regulus satrapa</i>	5	1.15
Ruby-crowned Kinglet	<i>Regulus calendula</i>	78	18.01
Townsend's Solitaire	<i>Myadestes townsendi</i>	2	0.46
Gray-cheeked Thrush	<i>Catharus minimus</i>	2	0.46
Swainson's Thrush	<i>Catharus ustulatus</i>	19	4.39
Hermit Thrush	<i>Catharus guttatus</i>	2	0.46
American Robin	<i>Turdus migratorius</i>	4	0.92
Varied Thrush	<i>Ixoreus naevius</i>	2	0.46
American Pipit	<i>Anthus rubescens</i>	1	0.23
Northern Waterthrush	<i>Parkesia noveboracensis</i>	48	11.09
Orange-crowned Warbler	<i>Oreothlypis celata</i>	29	6.70
Common Yellowthroat	<i>Geothlypis trichas</i>	32	7.39
American Redstart	<i>Setophaga ruticilla</i>	20	4.62
Yellow Warbler	<i>Setophaga petechia</i>	77	17.78
Magnolia Warbler	<i>Setophaga magnolia</i>	1	0.23
Blackpoll Warbler	<i>Setophaga striata</i>	27	6.24
Myrtle Warbler	<i>Setophaga coronata</i>	173	39.95
Townsend's Warbler	<i>Setophaga townsendi</i>	1	0.23
Wilson's Warbler	<i>Cardellina pusilla</i>	71	16.40
American Tree Sparrow	<i>Spizella arborea</i>	2	0.46
Chipping Sparrow	<i>Spizella passerina</i>	4	0.92
Savannah Sparrow	<i>Passerculus sandwichensis</i>	10	2.31
Fox Sparrow	<i>Passerella iliaca</i>	2	0.46
Lincoln's Sparrow	<i>Melospiza lincolni</i>	3	0.69
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	5	1.15
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	1	0.23
Slate-colored Junco	<i>Junco hyemalis</i>	188	43.42
Rusty Blackbird	<i>Euphagus carolinus</i>	1	0.23
White-winged Crossbill	<i>Carpodacus purpureus</i>	14	3.23
Pine Siskin	<i>Spinus pinus</i>	3	0.69
TOTAL		1,156	

Weather conditions largely influence the activities at the observatory. Windy conditions and periods of prolonged precipitation reduce the mist netting effort. Weather conditions also influence the number of birds counted on the visual migration counts due to challenges associated with visibility and the dynamic nature of bird migration in relation to wind patterns. Wind in particular can be problematic at the observatory due to the site being directly adjacent to Teslin Lake and that a number of the nets are located in minimal cover along the shoreline/beach. The 2022 season saw temperatures which were very warmer than average; the amount of wind was near average (Table 3, Table 4). The number of days with precipitation (19) was slightly below average.

Table 3. Summary of weather conditions during the 2022 fall season.

Weather Parameter	Week							
	1	2	3	4	5	6	7	8
Average Opening Temperature (°C)	9.0	6.3	8.8	8.9	7.6	6.3	4.0	3.6
Average Closing Temperature (°C)	16.5	13.8	18.2	18.1	14.1	15.0	13.1	12.3
Average Opening Wind (Beaufort scale)	1.0	0.7	1.7	0.4	1.6	1.3	1.3	1.9
Average Closing Wind (Beaufort scale)	1.5	2.6	1.7	2.1	2.1	1.7	3.3	2.7
Days with Rain (during count period)	3	1	1	0	2	1	1	0
Days with Snow (during count period)	0	0	0	0	0	0	0	0
Weather Parameter	Week				Whole Season			
	9	10	11	12				
Average Opening Temperature (°C)	5.4	3.7	6.0	-0.3	5.8			
Average Closing Temperature (°C)	12.0	11.7	12.4	3.5	13.9			
Average Opening Wind (Beaufort scale)	1.9	1.1	1.6	2.0	1.3			
Average Closing Wind (Beaufort scale)	2.3	1.7	3.0	2.0	2.1			
Days with Rain (during count period)	4	2	2	1	18			
Days with Snow (during count period)	0	0	0	1	1			

Table 4. Comparison of weather conditions during 2022 as compared to previous years.

Weather Parameter	Annual Average										2012 – 2021 Average
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Average Opening Temperature (°C)	6.0	4.7	4.4	4.8	4.7	3.5	4.1	3.5	4.1	5.8	4.4
Average Closing Temperature (°C)	14.4	11.8	10.2	12.1	12.6	14.3	12.9	11.1	10.9	13.9	12.3
Average Opening Wind (Beaufort scale)	1.5	1.4	1.3	1.6	1.6	1.4	1.4	1.3	1.4	1.3	1.4
Average Closing Wind (Beaufort scale)	2.7	2.3	2.5	2.4	2.3	2.0	1.9	1.9	2.3	2.1	2.3
Days with Rain (during count period)	14	32	19	16	21	14	13	30	28	18	20.8
Days with Snow (during count period)	0	5	2	1	4	1	2	2	7	1	2.7

3.2 Patterns in Captures

There was no apparent peak period for banding during the 2022 season as banding totals were relatively low throughout the season. However, the three highest daily banding totals occurred on August 20, 27, and September 4 (Figure 2). A number of species were banded on these dates with the majority being Alder Flycatcher, Myrtle Warbler, Slate-colored Junco, and Ruby-crowned Kinglet.

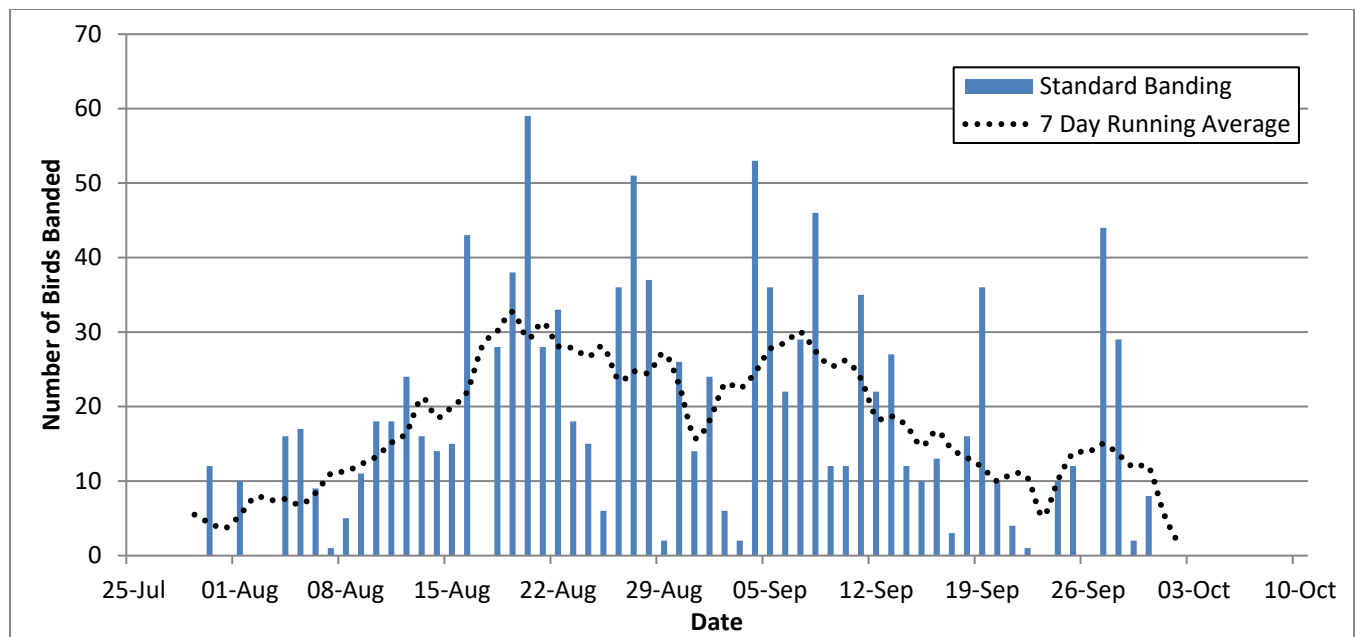


Figure 2. Summary of birds banded per day during the fall of 2022.

The number of birds banded during 2022 (1,156) was the lowest to date since the observatory began operations during 2008; the previous lowest daily total was during 2021 (1,856; Figure 3). When birds per net hour are taken into consideration, the 2022 value of 26.7 birds per 100 net hours was well below the long-term average of 48.8 and the previous low of 28.7 during 2012.

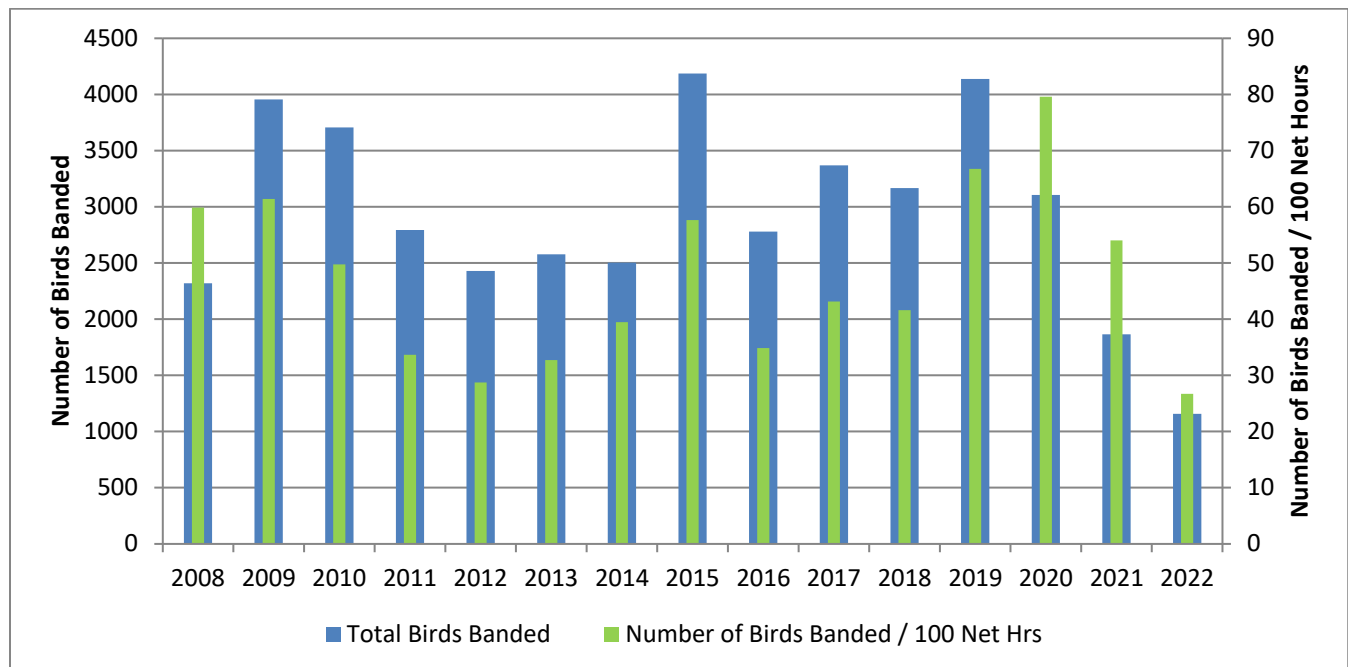


Figure 3. Summary of birds banded during the fall from 2008 to 2022.

3.3 Visual Migration Counts

The visual migration counts provide a method of estimating relative numbers of individuals in migration that would not be caught in mist nets. The counts are especially useful in observing raptors in migration and also serve as a method for monitoring waterbirds, waterfowl and some species of passerines. Note that birds seen during the migration counts which are not in active migration flight are not included in this section. Birds “in active migration flight” typically show a directed flight over the count area and do not appear to linger within the count area.

During the fall 2022 season, visual migration counts (standard & nonstandard) were conducted for 124.5 hours (Figure 4). The amount of counting effort during 2022 was below the 2008 to 2021 average of 244 hours of observation effort per year.

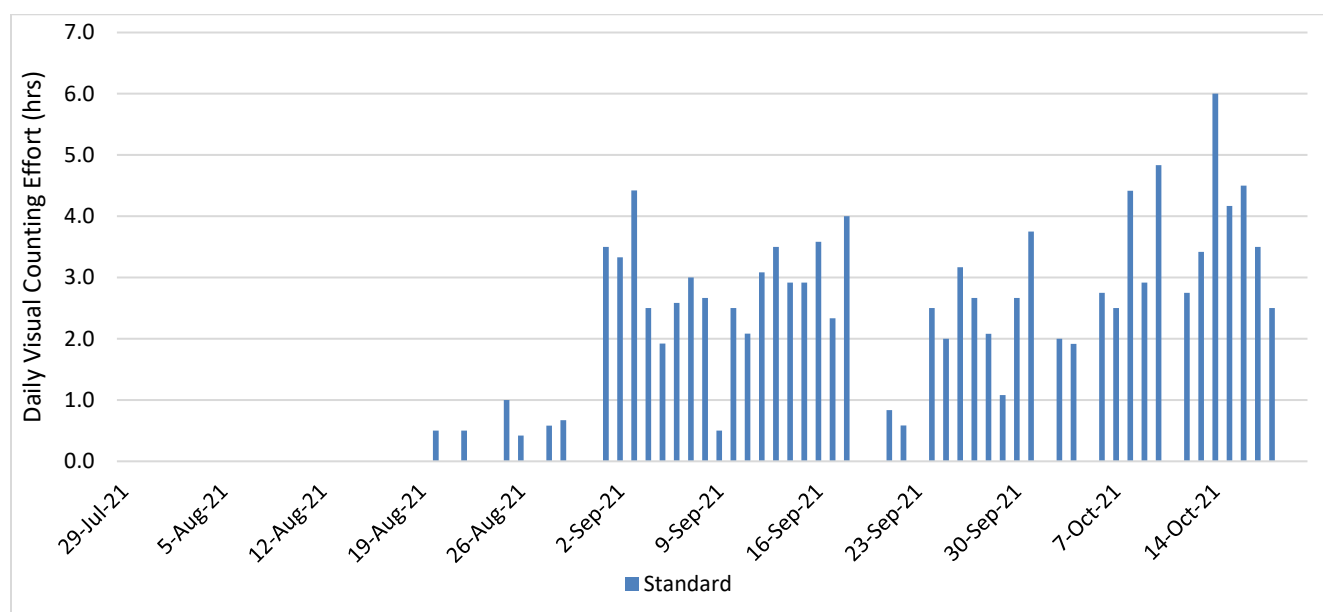


Figure 4. Visual counting effort, in hours each day, over the duration of the 2022 season.

A total of 15,926 birds were observed during the 2022 visual migration counts with waterfowl accounting for the largest proportion of the birds observed (Table 5). Compared to previous years and in similarity to 2020 and 2021, the number of birds observed during 2022 was relatively low for all species groups, particularly the waterbirds/shorebirds and raptors.

Table 5. Summary of birds observed on the visual migration counts from 2009 to 2022.

Year	Total Birds Observed					TOTAL BIRDS OBSERVED / HR	Visual Counting Effort (hrs)
	Waterbirds & shorebirds	Waterfowl	Raptors	Passerines	ALL SPECIES		
2009	4,927	8,219	1,612	11,000	25,758	201	128.1
2010	3,491	22,258	1,710	16,277	43,736	188	232.4
2011	1,072	31,548	3,680	37,951	74,251	218	340.6
2012	1,583	35,044	1,977	21,408	60,012	169	354.8
2013	2,166	7,852	2,466	28,839	41,323	147	280.9
2014	721	28,556	2,300	23,397	54,974	197	279.0
2015	3,878	22,560	4,211	11,797	42,446	218	194.6
2016	1,043	14,885	1,946	20,182	38,056	204	186.7
2017	436	9,497	980	13,626	24,539	87	235.6
2018	1,103	11,689	1,268	2,386	16,443	138	119.5
2019	1,690	30,544	2,095	15,705	50,034	248	201.6
2020	767	21,238	1,253	9,731	32,989	74	448.2
2021	593	17,588	1,865	8,189	28,235	160	176.3
2022	238	7,384	439	7,865	15,926	128	124.5
2009-2021 Average	1,805	20,114	2,105	16,961	40,984	173	244

3.4 Lake Counts

The lake counts provide monitoring data for various species of shorebirds, loons, grebes, waterfowl, and gulls/terns/jaegers. Six shorebird species were observed during the lake counts with all species observed in relatively low numbers with the exception of Spotted Sandpiper. A number of shorebird species typically observed in low numbers during past years were not observed in 2022 including Semi-palmated Sandpiper and Sanderling.

The majority of loons and grebes counted at the observatory are observed on the lake counts and this was once again the case during 2022 with a total of 498 loons and 297 grebes (Table 6). Geese and swans were observed in very low numbers during the lake counts; these species are typically observed flying over the site only (i.e. are visual migrants). However, for some duck species (scoters and mergansers), the lake counts record data to supplement the visual migration counts (Table 6). Only small numbers of dabbling and diving ducks are seen mostly due to scarcity of suitable stopover and feeding habitats near the observatory. As a group, gulls, terns and jaegers are well-monitored through the use of the lake counts; species of this group are the most commonly recorded birds using this method. A total of 7 species of gulls/terns/jaegers were observed on the 2022 lake counts.

Table 6. Summary of shorebirds (left), waterbirds (middle) and waterfowl (right) observed on the lake counts during 2022. One bird day represents one individual on one day; two bird days could represent single birds on two days or two birds on the same day.

Species	Total # of Bird Days	Species	Total # of Bird Days	Species	Total # of Bird Days
Least Sandpiper	4	Pacific Loon	112	Greater White-fronted Goose	9
Spotted Sandpiper	54	Common Loon	209	Canada Goose	13
Solitary Sandpiper	1	Red-throated Loon	170	Trumpeter Swan	3
Greater Yellowlegs	1	Yellow-billed Loon	6	<i>Unidentified Swan</i>	12
Lesser Yellowlegs	1	<i>Unidentified Loon</i>	1	Mallard	78
Wilson's Snipe	2	Red-necked Grebe	283	Green-winged Teal	12
		Horned Grebe	14	Northern Shoveler	1
		Short-billed Gull	165	American Wigeon	12
		Herring Gull	447	Surf Scoter	141
		Thayer's Gull	31	White-winged Scoter	54
		Sabine's Gull	11	Lesser Scaup	76
		Bonaparte's Gull	19	<i>Unidentified Scaup</i>	20
		Arctic Tern	18	Ring-necked Duck	1
		Parasitic Jaeger	3	Long-tailed Duck	1
		<i>Unidentified Gull</i>	6	Bufflehead	1
				Common Goldeneye	52
				Barrow's Goldeneye	32
				<i>Unidentified Goldeneye</i>	3
				Harlequin Duck	6
				Common Merganser	1,812
				Red-breasted Merganser	309
				<i>Unidentified Merganser</i>	5
				<i>Unidentified Diving Duck</i>	1
TOTAL	63	TOTAL	1,495	TOTAL	2,654

3.5 Visitors and Volunteers

Visitors and volunteers are normally a large component of TLBO's operation and once again during 2022 we were still able to attract local volunteers to assist with the observatory's operation. A total of 259 volunteer hours were tallied during the fall of 2022 and were represented primarily with Whitehorse based volunteers. The observatory had a total of 50 volunteers during 2022 summing to a total of 93 visitor hours.

4.0 Conclusion

The results from the operation of the Teslin Lake Bird Observatory in 2022 have continued to add to the knowledge of numerous aspects of bird biology in the Yukon, including: species distribution, migration timing and productivity. The location of the study site has proven to be effective for monitoring songbird migration. The primary reason for this is the close proximity of the site to Teslin Lake. As the lake is a very large body of water which migrating landbirds are hesitant to cross, many birds concentrate along the lakeshore and pass directly through and over the study site. On numerous occasions, flocks of migrating birds have been observed moving along the lakeshore and thus have yielded some very impressive banding and observation totals at the observatory.

Following fifteen years of fall migration monitoring at the observatory, the ability to monitor songbirds has been well demonstrated by the large numbers of migrants observed and banded on an annual basis. The results gathered this season also confirm the previous assumption that few birds stopover at the study site for extended periods of time. The majority of birds simply pass through the site while in migration and this is supported by the low proportion of band repeats within each season.

The visual migration and lake counts increase the number of bird species which may be monitored at the observatory and are now a key component of the observatory's activities. Together they serve to collect monitoring data for species not banded (or banded only in low numbers) including: waterfowl, loons/grebes, gulls/terns, raptors and some species of passerines, particularly American Robin, Varied Thrush, American Pipit, Rusty Blackbird, Common Redpoll and Pine Siskin. The raptors are a primary focus of these counts as these species are readily observed and identified from a distance. The ability to collect data on ages and color morphs of these species make this data even more valuable.

Over the long term, the data collected at the observatory will be used to refine species trends first prepared during 2022 to determine the status on bird populations. Given the location of the observatory, the birds counted at the site are known to originate in the Yukon and Alaska. Species trend data from this relatively small catchment area will be useful when used in combination with more southerly bird observatories which monitor birds from a much larger catchment area.

Appendix A – Species Checklist

Table A1. Birds banded and observed (✓) at Teslin Lake Bird Observatory from 2008 to 2022. Note that observations were not collected during the fall of 2005, 2006 and 2007; observatory was located at a different location on Nisutlin Bay during 2005.

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Bean Goose										✓													-	-	-
Greater White-fronted Goose	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Snow Goose					✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Cackling Goose												✓							✓		✓		-	-	-
Canada Goose	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Trumpeter Swan	✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Tundra Swan			✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Bewick’s Tundra Swan										✓	✓												-	-	-
Gadwall	✓						✓								✓						✓		-	-	-
American Wigeon	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Mallard	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Blue-winged Teal							✓																-	-	-
Northern Shoveler	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Northern Pintail	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
American Green-winged Teal	✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	-	-	-
Canvasback								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Redhead									✓	✓				✓	✓						✓		-	-	-
Ring-necked Duck	✓						✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Greater Scaup								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Lesser Scaup							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Harlequin Duck							✓	✓		✓	✓	✓	✓	✓		✓			✓	✓	✓	✓	-	-	-
Surf Scoter	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
White-winged Scoter	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Long-tailed Duck							✓			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	-	-	-
Bufflehead	✓				✓					✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	-	-	-
Common Goldeneye	✓		✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Barrow’s Goldeneye							✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	-	-	-
Hooded Merganser									✓	✓		✓				✓							-	-	-
Common Merganser	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Red-breasted Merganser	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Ruffed Grouse	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Spruce Grouse	✓						✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓		-	-	-
Red-throated Loon	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Pacific Loon								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Common Loon	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Yellow-billed Loon										✓	✓	✓		✓		✓	✓					✓	-	-	-
Horned Grebe								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Red-necked Grebe	✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Western Grebe											✓						✓						-	-	-
Double-crested Cormorant							✓																-	-	-
Great Blue Heron																✓							-	-	-
Turkey Vulture														✓									-	-	-
Osprey	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Golden Eagle							✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	-	-	-
Northern Harrier	✓		✓		✓		1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	✓	✓	✓	1	1	2
Sharp Shinned hawk	✓		✓		2		1	10	23	14	7	13	6	14	25	10	12	10	7	3	11	9✓	3	174	177
Northern Goshawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Bald Eagle	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Swainson’s Hawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		-	-	-
Red-tailed Hawk			✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Rough-legged Hawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Sora																			✓						
Sandhill Crane								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Black-bellied Plover											✓			✓									-	-	-
American Golden-Plover							✓			✓	✓		✓		✓	✓	✓				✓		-	-	-
Semipalmated Plover	✓				✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Killdeer	✓		✓		✓		✓			✓	✓					✓				✓	✓		-	-	-
Upland Sandpiper													✓		✓					✓			-	-	-
Black Turnstone												✓			✓								-	-	-
Stilt Sandpiper													✓										-	-	-
Sanderling								✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		-	-	-
Baird’s Sandpiper							✓	✓	✓		✓		✓		✓		✓		✓				-	-	-
Least Sandpiper					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	1	✓	✓	✓	✓	✓	✓	-	1	1
Pectoral Sandpiper					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Semipalmated Sandpiper								✓	✓	✓	✓	✓	✓		✓	✓		✓			✓		-	-	-
Western Sandpiper											✓					✓	✓						-	-	-
Surfbird																		✓					-	-	-
Short-billed Dowitcher							✓								✓								-	-	-
Long-billed Dowitcher								✓	✓	✓	✓	✓		✓	✓	✓	✓				✓		-	-	-
Wilson’s Snipe	✓		✓		✓		1	1	1	✓	✓	✓	✓	1	✓	1	✓	2	✓	✓	2	✓	1	8	9
Red-necked Phalarope									✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Red Phalarope																✓				✓			-	-	-
Spotted Sandpiper	1		2		1		1	✓	✓	1	2	✓	1	✓	✓	1	✓	✓	1	✓	1	1	5	8	13
Solitary Sandpiper	✓		✓	2	✓		✓	2	5	1	3	3	2	1	3	✓	✓	✓	1	✓	✓	✓	-	23	23
Wandering Tattler										✓													-	-	-
Greater Yellowlegs			✓		✓		✓		✓		✓		✓					✓				✓	-	-	-
Lesser Yellowlegs	✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	-	-	-

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Parasitic Jaeger								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Long-tailed Jaeger													✓										-	-	-
Pomarine Jaeger																						✓	-	-	-
Black-legged Kittiwake										✓				✓									-	-	-
Sabine’s Gull								✓	✓	✓	✓	✓		✓		✓	✓		✓	✓	✓	✓	-	-	-
Bonaparte’s Gull	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Little Gull										✓	✓												-	-	-
Mew Gull	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Ring-billed Gull																	✓						-	-	-
California Gull										✓		✓					✓						-	-	-
Herring Gull	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Thayer’s Gull								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Iceland Gull																✓			✓				-	-	-
Glaucous-winged Gull										✓	✓												-	-	-
Glaucous Gull								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		-	-	-
Arctic Tern	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Band-tailed Pigeon																					✓		-	-	-
Great Horned Owl								✓	✓	✓	✓			✓	✓	✓	✓		✓	✓	✓		-	-	-
Northern Hawk Owl								✓	✓	✓	✓	✓	✓	✓		✓		✓	✓		✓		-	-	-
Short-eared Owl			✓							✓	✓	✓							✓				-	-	-
Boreal Owl											4			40	✓	5						1	-	50	50
Northern Saw-whet Owl														2									-	2	2
Common Nighthawk								✓	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓	✓	-	-	-
Pacific Swift										✓													-	-	-
Rufous Hummingbird					✓											✓	✓	✓			✓	✓	-	-	-
Belted Kingfisher	✓		✓	8	✓		✓	8	6	5	6	6	2	9	6	4	3	3	1	6	2	5	-	80	80
Yellow-bellied Sapsucker	2		2		2		1		✓		3	1	1							✓			7	5	12
Downy Woodpecker	✓		✓					2	1	3	7			1	1	✓	✓	4	2	1	1	✓	4	27	31
Hairy Woodpecker	2		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	✓	✓	✓	2	2	4
Three-toed Woodpecker	✓							✓	✓	✓	✓	✓	1	✓	✓	✓	1	1	✓	✓	✓	✓	-	3	3
Black-backed Woodpecker								✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	-	-	-
Northern Flicker	1		✓		1		✓	✓	✓	1	1	✓	3	✓	✓	3	1	✓	✓	✓	✓	✓	2	9	11
Pileated Woodpecker	✓																						-	-	-
American Kestrel	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Merlin					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	2	3	✓	✓	✓	-	7	7
Gyr Falcon									✓	✓		✓		✓	✓			✓	✓	✓	✓	✓	-	-	-
Peregrine Falcon					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Olive-sided Flycatcher	✓		11		✓		6		✓	✓	1	✓	✓	✓	2	✓	✓	✓			✓	✓	17	3	20
Western Wood-pewee	3		2		2		✓	3	6	5	10	3	4	4	4	✓	1	6	4	✓	2	1	7	53	60

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Yellow-bellied Flycatcher	2	2	1		1			9	8	11	7	9	11	3	11	16	14	10	12	7	2	2	4	134	138
Alder Flycatcher	17	9	41	18	10	5	9	811	631	620	637	827	770	506	1058	498	548	358	918	1143	534	286	77	10535	10612
Least Flycatcher	3		4		3		2	2	1	3	10	3	6	2	4	7	2	2	✓	1	1	2	12	46	58
Hammond's Flycatcher	7		5		11		18	6	12	17	28	7	12	8	21	19	10	20	30	16	3	9	41	218	259
Dusky Flycatcher	2				2			1	6	3	6	3	3	4	2		4	6	3	3			4	44	48
Western Flycatcher												1				1							-	2	2
Eastern Phoebe			1																				1	-	1
Say's Phoebe			2		2		1	1	1	1	✓	✓	✓	✓	2	2	✓	✓	✓	1	✓	✓	5	8	13
Western Kingbird																	✓						-	-	-
Northern Shrike	✓								✓	1	1	1	1	1	✓	1	2	1	1	1	1	✓	-	12	12
Warbling Vireo	13		1	4	✓		1	9	10	19	17	15	48	12	10	24	19	17	10	15	3	9	15	258	275
Philadelphia Vireo																		1	1				-	2	2
Canada Jay	5		✓		1		✓		5	4	✓	✓	✓	1	1	✓	✓	4	4	1	2	✓	6	22	28
Steller's Jay											✓									✓	✓		-	-	-
Black-billed Magpie					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	4	1	✓	✓	✓	✓	-	5	5
Clark's Nutcracker																	✓								
Common Raven	✓		✓		✓		✓	✓	1	1	✓	✓	✓	✓	1	✓	✓	✓	✓	✓	✓	1	-	4	4
Horned Lark			3		✓		✓		✓	✓							✓	✓	✓			✓	3	-	3
Northern Rough-winged Swallow																✓									
Tree Swallow	5		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	5	-	5
Violet-green Swallow	✓		✓		✓		✓	✓		✓	✓	✓			✓	✓	✓	✓	✓		✓		-	-	-
Bank Swallow	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Barn Swallow	✓		✓		✓		✓	1	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	-	1	1
Cliff Swallow	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Black-capped Chickadee	✓	4	4	3	2		2	57	26	22	92	65	31	16	31	24	95	55	110	19	72	4	8	781	789
Mountain Chickadee							2	15	11		2	1	✓		4		1	2	1	✓	3		2	40	42
Chestnut-backed Chickadee								1			✓												-	1	1
Boreal Chickadee	2		3		2		8	138	831	✓	233	142	23	3	131	40	473	234	17	25	125	✓	15	2650	2665
Hybrid Chickadee			1					1															1	1	2
Red-breasted Nuthatch	✓				✓		1	3	2	2	5	12	6	3	9	3	4	4	5	3	3	✓	1	64	65
Brown Creeper											✓												-	-	-
Winter Wren	1										✓			1							✓		1	1	2
American Dipper														✓									-	-	-
Golden-crowned Kinglet		1					✓		10	2	1	3	1		2	3	4	7	5	4	1	5	-	49	49
Ruby-crowned Kinglet	25	7	51	3	27		72	29	175	109	86	134	125	69	284	89	114	150	192	54	121	78	175	1900	2144
Mountain Bluebird	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Townsend's Solitaire								✓	1	✓	1	1	✓	✓	✓	2	✓	✓	✓	✓	✓	2	-	7	7
Gray-cheeked Thrush	4	2	2		5		1	1	2	8	2	4	2	10	11	8	4	30	9	4	1	2	12	100	112
Swainson's Thrush	99	7	39	10	48		21	19	49	53	85	41	55	49	68	82	26	102	122	58	18	19	207	863	1070

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Hermit Thrush	1		1		✓		1	1	7	12	12	3	2	1	8	7	2	14	8		2	2	3	81	85
American Robin	27	1	36	5	17		4	✓	27	9	11	✓	4	9	3	✓	1	16	25	8	6	4	84	260	344
Gray Catbird																				1				1	1
Varied Thrush	✓		1		2		✓	3	12	5	2	2	5	3	2	✓	5	5	2	3	1	2	3	52	55
European Starling							✓																-	-	-
American Pipit	✓		2		✓		1	1	3	✓	2	✓	2	✓	6	2	✓	✓	✓	2	1	1	3	20	23
Bohemian Waxwing	✓		40		✓		23	✓	✓	✓	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	63	1	64
Cedar Waxwing									✓	2			8	✓			✓			✓	2	✓	-	12	12
Lapland Longspur	✓		✓		✓		5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	✓	✓	✓	✓	5	1	6
Smith's Longspur									✓				✓				✓						-	-	-
Snow Bunting										✓	✓	✓	✓	✓			✓	✓	✓	✓		✓	-	-	-
Rustic Bunting																			✓				-	-	-
Northern Waterthrush	4	1	14	10	11		4	46	53	54	42	47	46	48	53	34	34	47	58	45	31	48	33	744	777
Black-and-white Warbler															1				1				-	2	2
Tennessee Warbler	4		4		6		2		9	40	4	1	1	1	8	13	17	16	8	1			16	127	143
Orange-crowned Warbler	16	6	26	1	47		61	101	180	271	57	88	124	149	331	364	176	235	243	55	74	29	150	2719	2869
Nashville Warbler								1				1											-	2	2
MacGillivray's Warbler	1		1					1	3	2		1	1										2	8	10
Common Yellowthroat	1		17	4	11	6	21	66	113	70	72	45	65	82	89	57	59	81	146	74	55	32	50	1197	1247
American Redstart			6	4	1			10	43	30	39	21	33	25	47	15	23	28	22	19	6	20	7	413	420
Cape May Warbler							1					1											1	1	2
Magnolia Warbler	1							1			✓	1	1				1					1	1	5	6
Blackburnian Warbler															1								-	1	1
Yellow Warbler	10	6	50	19	37	3	31	486	325	471	310	225	333	504	556	449	163	266	655	404	154		128	5595	5723
Blackpoll Warbler	3	2	21	4	10		5	47	107	194	58	87	87	61	99	134	71	95	96	35	23	27	39	1322	1361
Yellow-rumped Warbler							1	1															1	1	2
Yellow-rumped Warbler (Myrtle)	60	3	63	5	29		78	49	284	673	142	195	163	178	311	286	654	478	379	138	160	173	230	4749	4979
Yellow-rumped Warbler (Audubon's)										✓	1												-	1	1
Townsend's Warbler			✓				1	✓	8	10	6	6	7	10	2	2	16	10	8	9	5	1	1	100	101
Wilson's Warbler	116	8	54	5	63		151	113	161	177	133	134	122	164	386	172	68	164	245	81	101	71	384	2445	2758
American-tree Sparrow	220		13	1	72		41	19	54	21	77	17	19	22	137	20	27	88	45	5	42	2	346	684	1030
Chipping Sparrow	28		4	1	6		3	6	24	18	28	17	20	15	29	31	38	18	50	34	1	4	41	335	376
Brewer's Sparrow				1					1		2						1	3	1				-	9	9
Fox Sparrow	106		3		17		26	11	28	28	17	6	7	17	42	10	13	99	15	3	12	2	152	310	462
Dark-eyed Junco					9		31	11	✓	✓	✓	✓			2								40	13	53
Dark-eyed Junco (Slate-colored)	165	12	139	5	135		224	182	582	420	331	116	341	140	209	229	443	348	384	139	213	188	663	4632	5295
White-crowned Sparrow	86	3	13		579		311	1	33	36	34	22	16	15	23	15	20	31	24	15	18	5	989	343	1332
Golden-crowned Sparrow	1				16		9						1	1	2			✓		1		1	26	6	32
White-throated Sparrow			✓		1													1					1	1	2

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Savannah Sparrow	11	2	2	2	24		10	14	18	18	23	25	18	17	55	17	12	25	48	16	14	10	47	334	381
Song Sparrow										1						1			1				-	3	3
Lincoln's Sparrow	9	1	6		39		21	5	16	15	27	9	9	9	65	13	14	54	39	11	19	3	75	363	438
Swamp Sparrow										1									2				-	3	3
Western Tanager			1						1		✓	✓						✓					1	1	2
Red-winged Blackbird	✓		1		1		✓		✓		✓	✓	✓			✓		✓	✓	✓			2	-	2
Rusty Blackbird	19		3		2	1	✓	11	30	20	16	9	14	10	18	6	14	3	17	1	12	1	24	183	207
Brown-headed Cowbird	1		✓		✓		✓			✓	1		✓	2	1			✓					1	4	5
Pine Grosbeak			2					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	-	2
Purple Finch	27		3		6		1	✓	✓	10	1	2	1	3	✓	✓	✓	3	1	2	✓	✓	37	23	60
Red Crossbill	3						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	3	-	3
White-winged Crossbill			5					2	2	100	1	2	5	2	✓	46	✓	✓	62	✓	3	14	5	239	244
Common Redpoll	✓		107		1		22	✓	6	1	75	47	✓	1	8	3	2	4	3	1	1	✓	130	152	282
Hoary Redpoll					3						2			✓					1				3	3	6
Pine Siskin	28		1				✓	1	1	91	10	3	8	303	1	3	151	2	87	4	✓	3	29	668	697
Evening Grosbeak														✓									-	-	-
TOTAL SPECIES BANDED	43	18	48	21	43	4	45	48	53	52	57	51	51	48	51	51	47	52	55	44	45	41	70	90	96
TOTAL BIRDS BANDED	1142	77	814	115	1267	15	1238	2319	3956	3706	2793	2429	2,577	2,510	4,186	2,780	3,369	3,167	4,138	2,471	1,865	1156	4,461	46,376	50,837

Appendix B – Daily Species Total Summary

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Greater White-fronted Goose	19-Aug	10	1722	03-Oct	1467	29-Aug
Snow Goose	30-Aug	9	189	18-Oct	58	04-Oct
Canada Goose	28-Aug	7	92	14-Oct	26	24-Sep
Unidentified Goose	10-Oct	2	33	14-Oct	32	10-Oct
Trumpeter Swan	6-Sep	11	1161	18-Oct	710	14-Oct
Tundra Swan	27-Sep	12	2082	18-Oct	1568	14-Oct
Unidentified Swan	11-Sep	11	884	16-Oct	474	14-Oct
American Wigeon	25-Aug	9	101	11-Oct	24	11-Oct
Mallard	30-Jul	50	124	15-Oct	10	30-Sep
Northern Shoveler	4-Aug	4	7	07-Oct	3	30-Sep
Northern Pintail	22-Aug	11	101	11-Oct	20	11-Oct
Canvasback	7-Sep	5	42	14-Oct	20	30-Sep
Ring-necked Duck	28-Aug	5	23	11-Oct	18	30-Sep
Greater Scaup	23-Sep	7	44	11-Oct	20	11-Oct
Lesser Scaup	3-Sep	20	528	15-Oct	127	07-Oct
Unidentified Scaup	21-Sep	5	36	15-Oct	20	10-Oct
Unidentified Scaup	21-Sep	5	36	15-Oct	20	10-Oct
Surf Scoter	5-Aug	24	402	15-Oct	160	23-Sep
White-winged Scoter	19-Aug	16	109	15-Oct	47	25-Sep
Harlequin Duck	29-Aug	3	6	05-Oct	3	29-Aug
Long-tailed Duck	15-Oct	2	24	16-Oct	23	15-Oct
Bufflehead	31-Aug	4	10	16-Oct	4	04-Oct & 15-Oct
Barrow's Goldeneye	30-Jul	13	38	14-Oct	7	11-Aug
Common Goldeneye	10-Oct	8	107	18-Oct	61	15-Oct
Unidentified Goldeneye	16-Aug	6	13	02-Oct	4	02-Oct
Common Merganser	4-Aug	54	1873	18-Oct	195	02-Oct
Red-breasted Merganser	4-Aug	49	329	17-Oct	33	13-Sep
Unidentified Merganser	11-Sep	1	5	11-Sep	5	11-Sep
Unidentified Duck	14-Oct	2	28	15-Oct	27	15-Oct

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Ruffed Grouse	13-Aug	21	37	02-Oct	4	25-Sep
Red-throated Loon	4-Aug	58	192	18-Oct	18	25-Aug
Pacific Loon	11-Aug	41	154	15-Oct	21	12-Sep
Common Loon	1-Aug	59	218	16-Oct	13	14-Sep
Yellow-billed Loon	6-Oct	5	8	18-Oct	2	06-Oct
Unidentified Loon	25-Sep	8	20	15-Oct	4	25-Sep
Horned Grebe	26-Aug	12	23	04-Oct	5	11-Sep
Red-necked Grebe	6-Aug	62	303	18-Oct	26	27-Aug
Osprey	19-Aug	26	40	10-Oct	3	many days
Golden Eagle	26-Sep	12	42	16-Oct	14	10-Oct
Bald Eagle	30-Jul	52	106	16-Oct	8	27-Sep
Northern Harrier	25-Aug	37	88	15-Oct	10	18-Sep
Sharp-shinned Hawk	6-Aug	40	154	14-Oct	16	18-Sep
Northern Goshawk	15-Sep	5	6	15-Oct	2	15-Sep
Red-tailed Hawk	29-Aug	7	8	29-Sep	2	29-Aug
Red-tailed Hawk (Harlan's)	3 seo	16	51	16-Oct	21	27-Sep
Rough-legged Hawk	26-Sep	13	34	16-Oct	6	10-Oct
Unidentified Buteo	2-Sep	3	4	18-Sep	2	18-Sep
Sandhill Crane	2-Oct	3	13	15-Oct	6	10-Oct
Semipalmated Plover	11-Aug	4	4	29-Aug	1	many days
Least Sandpiper	1-Aug	5	6	28-Aug	2	28-Aug
Pectoral Sandpiper	12-Aug	2	12	07-Sep	11	07-Sep
Wilson's Snipe	29-Aug	3	3	07-Sep	1	many days
Red-necked Phalarope	20-Aug	1	3	20-Aug	3	20-Aug
Spotted Sandpiper	30-Jul	22	55	01-Sep	7	25-Aug
Solitary Sandpiper	9-Aug	1	1	09-Aug	1	09-Aug
Lesser Yellowlegs	1-Aug	1	1	01-Aug	1	01-Aug
Greater Yellowlegs	30-Jul	2	2	10-Aug	1	30-Jul
Unidentified Shorebird	5-Aug	3	28	02-Sep	20	02-Sep

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Parasitic Jaeger	20-Aug	6	8	04-Sep	3	03-Sep
Pomarine Jaeger	13-Oct	1	1	13-Oct	1	13-Oct
Bonaparte's Gull	6-Aug	3	19	16-Aug	17	06-Aug
Sabine's Gull	27-Sep	6	11	18-Oct	2	many days
Short-billed Gull	4-Aug	47	165	30-Sep	13	20-Aug
Herring Gull	30-Jul	64	454	18-Oct	50	01-Aug & 04-Aug
Thayer's Gull	1-Sep	19	59	08-Oct	12	30-Sep
Arctic Tern	9-Aug	9	20	02-Sep	4	11-Aug & 16-Aug
Unidentified Gull	1-Sep	5	8	03-Oct	2	many days
Common Nighthawk	20-Aug	1	1	20-Aug	1	20-Aug
Rufous Hummingbird	1-Aug	1	1	01-Aug	1	01-Aug
Belted Kingfisher	4-Aug	36	50	17-Sep	3	14-Aug & 15-Aug
Downy Woodpecker	10-Sep	2	2	13-Sep	1	10-Sep & 13-Sep
Hairy Woodpecker	2-Oct	1	1	02-Oct	1	02-Oct
American Three-toed Woodpecker	5-Sep	2	3	16-Sep	2	16-Sep
Black-backed Woodpecker	4-Oct	1	1	04-Oct	1	04-Oct
Northern Flicker	27-Aug	4	4	28-Sep	1	many days
American Kestrel	6-Aug	24	43	01-Oct	5	05-Sep
Merlin	15-Aug	18	20	05-Oct	2	29-Aug & 9-Sep
Gyr Falcon	6-Oct	1	1	06-Oct	1	06-Oct
Peregrine Falcon	25-Aug	6	7	20-Sep	2	17-Sep
Unidentified Falcon	25-Aug	3	3	16-Sep	1	many days
Olive-sided Flycatcher	20-Aug	3	3	16-Sep	1	many days
Western Wood-Pewee	10-Aug	5	6	16-Sep	2	16-Sep
Yellow-bellied Flycatcher	20-Aug	2	2	24-Aug	1	20-Aug
Alder Flycatcher	1-Aug	40	320	18-Sep	38	16-Aug
Hammond's Flycatcher	10-Aug	9	10	04-Sep	2	15-Aug
Least Flycatcher	10-Aug	2	2	21-Aug	1	10-Aug & 21-Aug
Say's Phoebe	1-Sep	1	1	01-Sep	1	01-Sep

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Northern Shrike	24-Sep	2	2	25-Sep	1	24-Sep
Warbling Vireo	30-Jul	14	19	01-Oct	3	10-Aug
Canada Jay	15-Oct	1	1	15-Oct	1	15-Oct
Black-billed Magpie	4-Sep	30	39	18-Oct	5	05-Oct
Common Raven	30-Jul	75	250	18-Oct	21	02-Oct
Bank Swallow	8-Aug	5	22	29-Aug	10	11-Aug
Cliff Swallow	4-Aug	5	7	02-Oct	3	11-Aug
Barn Swallow	11-Aug	7	35	23-Aug	10	15-Aug
Unidentified Swallow	10-Aug	3	27	06-Sep	25	10-Aug
Black-capped Chickadee	1-Aug	60	148	18-Oct	5	19-Sep & 20-Sept
Boreal Chickadee	1-Aug	5	5	12-Oct	1	many days
Red-breasted Nuthatch	21-Aug	1	1	21-Aug	1	21-Aug
Golden-crowned Kinglet	21-Aug	8	9	01-Oct	2	05-Sep
Ruby-crowned Kinglet	1-Aug	39	100	10-Oct	12	04-Sep
Mountain Bluebird	16-Sep	4	12	03-Oct	7	23-Sep
Townsend's Solitaire	22-Aug	17	72	28-Sep	17	06-Sep
Gray-cheeked Thrush	7-Sep	2	2	08-Sep	1	07-Sep & 08-Sep
Swainson's Thrush	30-Jul	24	36	07-Sep	4	21-Aug
Hermit Thrush	4-Sep	2	2	05-Sep	1	04-Sep
American Robin	1-Aug	42	814	15-Oct	275	16-Sep
Varied Thrush	19-Aug	29	1175	30-Sep	421	08-Sep
Unidentified Large Thrush	3-Sep	16	221	28-Sep	53	08-Sep
American Pipit	23-Aug	32	135	02-Oct	22	30-Aug
Bohemian Waxwing	30-Jul	19	465	30-Sep	128	04-Sep
Cedar Waxwing	20-Aug	1	6	20-Aug	6	20-Aug
Unidentified Waxwing	12-Aug	3	45	22-Aug	30	22-Aug
Lapland Longspur	30-Aug	12	22	11-Oct	8	30-Aug
Northern Waterthrush	30-Jul	29	70	13-Sep	6	11-Aug
Orange-crowned Warbler	9-Aug	23	41	27-Sep	5	11-Sep

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Common Yellowthroat	5-Aug	22	39	21-Sep	6	04-Sep
American Redstart	1-Aug	17	28	08-Sep	4	1-Aug & 1-Sep
Yellow Warbler	30-Jul	38	178	15-Sep	13	12-Aug
Blackpoll Warbler	1-Aug	23	63	08-Sep	14	31-Aug
Yellow-rumped Warbler (Myrtle)	30-Jul	59	3007	06-Oct	1235	04-Sep
Townsend's Warbler	8-Aug	7	11	01-Sep	3	14-Aug
Wilson's Warbler	1-Aug	44	100	02-Oct	7	20-Aug
Unidentified Warbler	30-Jul	22	167	02-Oct	33	08-Sep
American Tree Sparrow	20-Sep	2	2	04-Oct	1	20-Sep & 4-Oct
Chipping Sparrow	4-Aug	7	10	02-Sep	2	many days
Fox Sparrow	30-Jul	5	6	04-Sep	2	28-Aug
Dark-eyed Junco (Slate-colored)	30-Jul	51	279	11-Oct	34	27-Sep
White-crowned Sparrow (Gambell's)	20-Aug	9	11	27-Sep	2	20-Aug & 27-Sep
Savannah Sparrow	10-Aug	20	29	19-Sep	3	many days
Lincoln's Sparrow	8-Aug	3	4	06-Sep	2	04-Sep
Rusty Blackbird	26-Aug	25	120	16-Oct	39	16-Sep
Pine Grosbeak	8-Sep	1	2	08-Sep	2	08-Sep
Purple Finch	30-Jul	10	12	05-Sep	2	30-Jul & 04-Aug
White-winged Crossbill	30-Jul	67	421	16-Oct	26	02-Sep
Red Crossbill	5-Aug	3	13	11-Oct	7	11-Oct
Common Redpoll	16-Aug	12	34	18-Oct	20	14-Oct
Pine Siskin	1-Aug	37	194	17-Oct	17	07-Sep
Unidentified Finch	31-Aug	6	140	04-Oct	50	04-Oct
Unidentified Passerine	20-Aug	33	2022	03-Oct	569	08-Sep